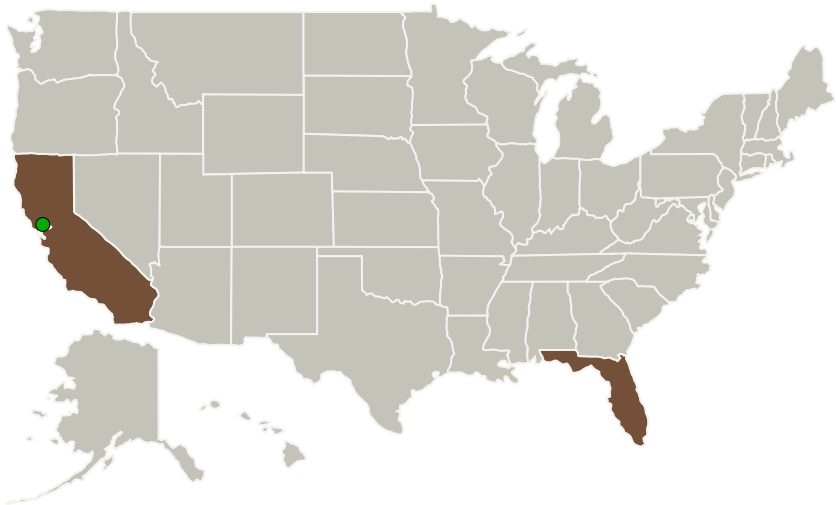
Industrial Crystallization Facility for Nonlinear Optical Materials, Phase I

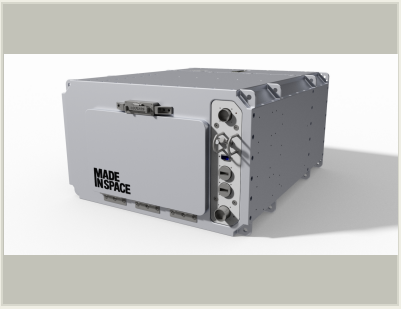
Completed Technology Project (2017 - 2017)

Project Introduction

Made In Space, Inc. (MIS) proposes the development of an Industrial Crystal Facility (ICF) for microgravity product manufacturing and applied research. The ICF is focused on advanced materials engineering, rather than biomedical research, and serves a complimentary role to existing NASA-developed hardware, expanding utilization of ISS. Intended applications include nonlinear optical single crystals and other relatively large material formulations. This is a critical next step in the development of Low Earth Orbit as an economic development zone, using the ISS National Lab as a proving ground and following the forthcoming Made In Space Fiber (MIS Fiber) demonstration of manufacturing a product in space with economically-significant intrinsic value on the ground. The ISS National Lab serves as an ideal platform to explore whether industrial crystals can be grown in microgravity to larger sizes and/or improved quality as compared with terrestrial sources. Existing low temperature solution growth methods take days to weeks to complete, so parabolic flights and suborbital vehicles are not suitable for establishing process baselines and making effective comparisons. Microgravity production holds the potential for room-temperature production of NLO materials for high-energy applications with size and quality undiminished by the effects of sedimentation and convection. A new facility is needed to explore the feasibility of microgravity-enabled industrial crystals as a new product market for Low Earth Orbit.

Primary U.S. Work Locations and Key Partners





Industrial Crystallization Facility for Nonlinear Optical Materials, Phase I Briefing Chart Image

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Organizations Performing Work	Role	Type	Location
Made in Space, Inc.	Lead Organization	Industry	JACKSONVILLE, Florida
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Florida

Images

Briefing Chart Image
Industrial Crystallization Facility for Nonlinear Optical Materials, Phase I Briefing Chart Image
(https://techport.nasa.gov/image/136939)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Made in Space, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

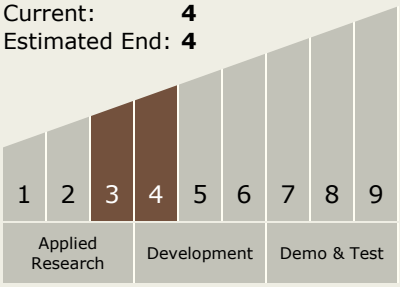
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Eric R Joyce

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.7 Special Materials